

## Annual Report of County Engineer.

To The Honorable Board of Supervisors, of The County of Maui, Territory of Hawaii.

Gentlemen:—

In accordance with your instructions, I beg leave to present herewith a report of the work in my Department for the year ending December 31st, 1908, which, owing to the limited time remaining for its preparation since the receipt of your instructions, must necessarily consist of but a brief summary, of my monthly reports.

Complete surveys, except where noted, have been made of the following relocations of roads, with cross sections, plans and specifications: Kuau to Maliko, 10,400 ft.; Maliko Gulch, 4,600 ft.; Top Maliko, to Junction Main Road, 3,950 ft.; Road through Sisal Field, 3,225 ft.; Haiku to Puomalei, 26,125 ft.; Kaluanui to the Cemetery, 4,600 ft.; Kamole Hill to Court House, 4,600 ft.; Ukumehame Flat, 6,500 ft.; Kaanapali Road, 8,200 ft.; Extension Iao Road to Table Land, 11,000 ft.; Ukumehame Grade from Mountain Road to Flat, 3,200 ft.; Honouliualoa, Molokai, Bridge and fill; Launiupoko Bridge and Approach, Lahaina; Moalii Bridge, Lahaina; Halawa Bridge, and Road, 4,200 ft.; Wai-palani Gulch, 1,800 ft.; Road and Culverts, Pauwela to Kaupakalua, 16,000 ft.; Paia-Makawao Road near Church, 2,300 ft.; Napili to Honokohau, 6,000 ft.; Two Concrete Bridges, Kahului; Kalnaihakoko Road (Unfinished); Extension Kuau-Maliko Road, 675 ft.; a total of 117,425 ft. about 22½ miles.

Of the above, the following were constructed, under the supervision of this Department: Kuau-Maliko Road, Contractor J. H. Wilson; Road through Sisal, Contractor A. A. Wilson; Road and Bridge, Halawa to Honokala, Contracts in sections to laborers, bridge by day work; Napili to Honokohau, Contractor A. A. Wilson; Section 2, Relocation of Belt Road from Pauwela East, contract let to J. A. Aheong, work not yet begun; Two concrete bridges, Kahului Contract Chas. O'Sullivan; Extension Kuau-Maliko Road Contract in sections with laborers.

Surveys were made of the following roads for Right of way deed: Kailua to Naililihaele, Kuau-Maliko, Road through Sisal, Kamole Hill to Court House, Kaluanui to Cemetery, Napili to Honokohau, Kaanapali Road, Ukumehame Flat.

Exchange deeds were made executed for the first of these, but the other seven are still in the hands of the County Attorney. (Delivered to me Jan. 2, 1909.)

Curb lines on Market Street and Vineyard Street were laid out and mapped, which were approved officially by your Honorable Board. Lines and grades for macadamizing were also given on Main Street, Market Street, Vineyard Street, Church Street, and High Street, also fence lines in Kahului for a 60 ft. street.

A survey and description of a 2-acre lot in the sand hills was made for the new county stables, a lease draw up and executed, with the following terms: Rental, \$45.00 per year in advance; term 10 years with privilege of renewal for another 10 years at same rental.

Plans were made of stable building, tool and feed rooms, and house for steam roller and other machinery, which have been approved by your Honorable Board.

As a result of negotiations had with the Public Works Department, the old Court House building was turned over to the County of Maui,

in consideration of the assistance rendered to the Territorial government by the County in improving the grounds about the Court House and Jail buildings. Also, a conference with the Trustees of the Kaahumanu Church property resulted in the execution by them of a lease to the County for 25 years without rental, the whole of the occupied portion of the church lot for the purpose of a public park and Town Hall site, enlarged and repaired, and plans and specifications drawn up for its conversion into a suitable hall for public purposes, with a seating capacity of about 300, an ample stage, dressing rooms etc., and a contract was let in accordance with these plans and specifications. The work will be completed under this contract by the middle of January.

Plans were made for improving the grounds about the Court House and County Buildings, which were approved by your Honorable Board, and the work indicated by these plans practically completed with the exception of the cement walks and curbs.

Explorations and water measurements were made in the forest on the Northern slope of Haleakala to locate a water supply for Kula and beyond. A permanent supply was found and a system devised and recommended that will give an average daily supply of 100,000 gallons, in the driest weather, the end of the line being at Kanaio at an elevation of nearly 3000 feet. The estimate cost is \$70,000. The quantity of water is believed to be sufficient for at least 20 years.

Although it has been a disappointment to me that the matter of oiling our macadamized roads has not received the attention by this County that this efficient and economical method deserves, fortunately there has been enough of it authorized and completed to serve as an object lesson to prove its value. The section near Spreckelsville that was made in 1908 is still in good order, although through inexperience the method employed was not the best. The section at Kahului about 1,000 feet in length, is much better, due to better methods of application, although it requires some slight repair which should be made as soon as the weather is dry enough. The section at Ukumehame is nearly ideal, where the latest known method was employed, and conditions were of the best.

The cost of this treatment will not be over \$700 to \$800 per mile for an 18 foot road, and the cost of repairs, if repairs are made in time, should not be over \$25 per year.

This amount is saved every 8 or 10 months, as a conservative estimate, from the cost of sprinkling, which is neither required nor desired on oiled roads. When it is considered that our macadamized roads cost on an average of \$5000 a mile to construct, for the macadamizing alone, and an addition of only 15% to that cost suffices to treat them with oil, which not only produces the very best class of pavement known in the world for the amount and kind of travel to which our roads are subjected, but which effects a saving very conservatively estimated at say \$500 per year for each mile of road, I can not say how this County can afford to postpone any longer the adoption of the policy of oiling all its macadamized roads, old and new, from Haiku to Lahaina. Where the amount of rainfall is abundant, as in the Hana District, there is always sufficient moisture to preserve the bond of the stone, but the dry districts must water their macadam or oil it, or suffer the consequence of dusty roads part of the time, muddy roads rest of the time, and within a few months after the macadam is laid, bumpy road all the time.

Various comparatively minor matters, too numerous to include in a report of this nature, but occurring from day to day in the natural course of events, are omitted. It is a source of gratification

that the "Rules of Procedure" for the disposition of changes in roads, and the various forms for contracts, bonds etc., which were recommended by this Department, and which were improved by some valuable amendments made by your Honorable Board, have been by Resolution made a part of this County's system. It is my opinion that an amendment to the County Act should be recommended, embodying these matters, and repealing the portions of the old Territorial Road Laws which these rules were intended to replace.

In conclusion, as an appointive officer of this Honorable Board, I wish to express my appreciation of the uniform courtesy which you have extended me, and to congratulate you on the established fact that County Government is no longer in the experimental stage, but that it is, in this County of "Maui noka oi" at least, an unqualified success, and that the major portion of the credit for this is due to you.

Respectfully submitted,  
HUGH HOWELL,  
County Engineer.

## Report of Kula Pipe Line Survey.

Wailuku, December 31, 1908.  
Mr. Hugh Howell,  
County Engineer  
Wailuku, Maui.

Sir:—

I beg herewith to report on the preliminary survey for the proposed Kula Pipe line. Lack of time and funds have not allowed me to go into the survey as far as I would have liked, but I trust that enough information has been gained upon which to make a good estimate of the feasibility, permanency and cost of the line as I have located it.

By measuring the streams found by Mr. Kluegel, the flow shows such a decrease from that recorded upon the day of his visit, due to the continuance of dry weather, that it was manifestly imperative to investigate further into the water bearing area. The trail was extended on to the edge of Kamae valley at about the same elevation, 5,000 feet, without discovering a sufficient amount of water to warrant this increase in length. (See table 1) At this time driest weather prevailed, therefore we were convinced that we were at too great an elevation for the required permanent supply. Trails were then cut down along each gulch, and the flow of water in them was measured at elevations from 100 to 300 feet lower than at the original points at the trail. The difficulty of climbing up and down all of these gulches was too great to admit of measuring all of them on any one day, so the following method of determining the flow was resorted to.

The rate of increase of flow, corresponding to the drop in elevation, was calculated for each stream, and it was found that this rate of increase would indicate a flow at a line 500 feet below the trail about 8 times as great as the flow at the original trail. (See table 2) Allowing a safety factor of about 4 for the assumption of such uniform increase, and assuming on this basis a ratio of 2 to 1 in the flows at the two levels, Table 3 was prepared, which shows that a safe location of the watershed would certainly be not lower than 4500 feet at the terminus at Honomanu.

Stream measurements were continued at the different levels on each stream until Nov. 25th when the weather became so rainy that it was impossible to measure the streams without a more elaborate and expensive apparatus. The flow from Nov. 25th to Dec. 26th has never been below 1,000,000 gallons per day.

The storm which prevailed between Nov. 25th and the first part of December made work in the woods impossible so I ran out the grade line to Kula, running as far as Waiakoa, and went over the country from the end of the survey-

ed line to Kanaio, and found this last belt of country similar in formation to the portion where the line was actually staked out.

The accompanying map shows the location of the line from the water head to Kanaio; the portion from the water-head to Wainkua is plotted from actual survey and the balance sketched on from several known points along the route. Elevations and distances have been checked by means of the various triangulation stations along the route.

During the last of October and up to the 25th of November better weather could not have been had for the purpose. In November and leading up to it, one of the driest periods ever known prevailed, since the rain gauge was established at Ukulele in 1904. It was during this spell that my stream records are most valuable. The accompanying data on rain and run-off are from daily records taken in Oct., Nov., and Dec.

The principal streams are Waiakamoi, Puohakamoa and Honomanu which with several lesser streams have been investigated as thoroughly as possible.

My records show that .20 of an inch of rain at Ukulele, an amount which is very common at this point, which indicates about .5 inches at Honomanu, will show an aggregate run-off of about 2,000,000 gallons per day at 4,500 feet elevation in the several water courses up to and including Honomanu. All the streams investigated gain their dry weather flow from seepages from the under-matting of the forest and this flow increases very rapidly as one goes down their courses as before noted. There are about 6,000 acres of watershed from which the streams may gain their flow, and 2,000 acres of this are covered with forest which at present has a very good undermatting. This will increase in value rather than lessen for the reason that the forest is now thoroughly protected from cattle and fire, thus allowing the vast number of young trees now springing up to grow undisturbed.

While the minimum flow as shown in Table 3 is 60,260 gallons at the close of a most unprecedented drought, this should not be taken as a basis for calculating the supply to the arid district.

As conditions are, where we have to rely on the natural conservation by means of the forest growth rather than on reservoirs at the supply end, which for the present, at least, are impracticable, the pipe is required to carry more than the minimum run-off for the driest day or even the average daily run-off for the driest week. The conclusion is, then, that the water should be stored by the consumers in their own cisterns.

The capacity of the cisterns already in existence throughout the region to be supplied by the proposed pipe has been approximated very closely at 11,190,000 gallons as a conservative figure. It can properly be assumed that each household has a cistern capacity sufficient for at least 4 months, and most have several times more. Therefore the monthly flow can certainly be safely used as the smallest unit in estimating the supply from the water shed, provided that the pipe be made of sufficient capacity to tide over the few days that the daily flow is less than the daily consumption.

If the daily consumption is reckoned at 100,000 gallons, there are only from days recorded during the driest spell in November when the flow falls below this. (See Table 3.) If the capacity of the pipe were 10% greater than the daily consumption it would be ample, but the capacity of a 4 inch pipe on a 1½% grade is over 150,000 gallons per day, therefore it will be entirely feasible to keep all the cisterns practically full all the time.

The country over which the pipe will be laid with the exception of that within the forest and especially between Puohakamoa and Honomanu gulches, is rolling and easily accessible by wagons. While cross-

ing the Haleakala Ranch lands, an old private road can be repaired and used. From Kaliahuni to Keoken, the Kula Homestead road parallels the line and from Keoken on, the main government roads (old and new) are within easy access of the line. Within the forest, a good horse trail is required both for construction and maintenance purpose.

Respectfully submitted,  
J. C. FOSS JR.,  
Assistant Engineer in charge of  
Proposed Kula Pipe Line Survey.

## NOT POOR.

A traveler passing the Board Top Mountain district in northern Bedford County, Pennsylvania, last summer, came across a lad of sixteen cultivating a patch of miserable potatoes. He remarked upon their unpromising appearance and expressed pity for anyone that had to dig a living out of such soil.

"I don't need no pity," said the boy resentfully.

The traveler hastened to soothe his wounded pride. But in the offended tone of one who has been misjudged the boy added: "I ain't as poor as you think. I'm only workin' here. I don't own this place."

## A MOTHER'S TROUBLES.

A colored woman was brought before a West Virginia magistrate charged with inhuman treatment of her child. Evidence was clear that she had severely beaten the youngster, who was in court to exhibit his marks and bruises. Before imposing sentence the magistrate asked the woman if she had anything to say.

"Kin Ah ask yo' honah a question?"

His honor nodded.

"Well, then, yo' honah, I'd like to ask yo, whether yo' was ever the parent of a puffedly wuthless cullid chile?"

## HEN PECKED.

A wizened little man charged his wife with cruel and abusive treatment. His better half, or in this case better two-thirds, was a big, square-jawed woman with a determined eye.

The judge listened to the plaintiff's recital of wrongs with interest.

"Where did you meet this woman who, according to your story, has treated you so dreadfully?" his honor asked.

"Well judge," replied the little man, making a brave attempt to glare defiantly at his wife. "I never did meet her. She just kind of overtook me."

## DENNY AND JERREY.

"One day," related Denny to his friend Jerry, "when Oi had wandered too far inland on me shore leave Oi suddenly found that there was a great big haythen, tin foot tall, a chasin' me wid a knife as long as yer arm. Oi took to me heels an' for fifty miles along the road we had it nip an' tuck. Thin I turned into the woods an' we run for one hundred an' twenty miles more, wid him gaining on me steadily owin' to his knowledge of the country. Finally, just as Oi could feel his hot breath burnin' on the back of me neck, we came to a big lake. Wid one great leap Oi landed safe on the opposite shore, leavin' me pursuer confounded and impotent wid rage."

"Faith an' that was no great jump," commented Jerry, "considerin' the runnin' shart ye had."

## THE FASHION IN SHOES.

Aunt Anne, an old family dandy, was sitting with knees crossed in the kitchen, when the daughter of the house entered and, impressed with the hugeness of the old woman's feet, asked what size shoe she wore.

"Well, honey," replied Aunt Anne, "I kin wear eights; I generally wears nines; but dese yer I se got on am twelves, an' de good Lawd knows dey hu's me!"

## Japanese Red Cross Society Holds Meeting.

The Japanese red cross society of Wailuku and Punnene held a meeting in the grounds of the residence of Dr. T. Mori, on High Street, forenoon of Sunday, January 3rd. The grounds were tastefully decorated with flags and bunting, and an exhibition was given of the nature of the society's work on fields of battle, under the direction of the officers and surgeons of the society, showing the methods of caring for the wounded the manner of carrying them off on stretchers, and the methods of applying bandages and other first aids to the injured.

Men wearing uniforms of surgeons and women nurses dressed in white with red cross badges on arms were in attendance. There was some speech making, and a hundred and thirty new members were enrolled. The society has a very large membership, among the Japanese. Some subscriptions were taken for the relief of Sicilian sufferers from earthquakes.

## REAL ESTATE DOINGS.

Recorded, December 19, 1908.

Antonio Francisco to Louisa Kalaluh; D; pc land Puuhooi, Lahaina, Maui; \$1. B 311, p 229. Dated Feb. 29, 1908.  
Antonio Francis co to Louisa Kalaluh; D; pc land Kelaewa, Lahaina, Maui; \$1. B 311, p 230. Dated Apr. 18, 1909.  
Antonio Francisco to Louisa Kalaluh; D; R P 2731, Ap 3 and 7269 Ap 2, por R P 1962, Aps 1 and por Kul 10225 and 6 Ap 2 and 4, pes land Polapola, etc, Lahaina, Maui; \$1. B 311, p 232. Dated Dec. 17, 1908.

Joe Kaolu to D T Fleming; D; int in 6 3-4 a. in hui land, Ulumalu, Hamakualoa, Maui; \$74.25. B 315, p 47. Dated Dec. 4, 1908.

Haokakai and hsb to D T Fleming; D; int in 5 a. land Ulumalu, Hamakualoa, Maui; \$50. B 315, p 48. Dated Dec. 1608.

Julia Seong and hsb (G G) to Lahaina Agrest Co Ltd; D; int in R P 1678, Kul 3322-B, Uhaio, Lahaina, Maui; \$600. B 315, p 64. Dated Dec. 18, 1908.

Recorded, December 21, 1908.

Antone Freitas and wf to Julia Rickard; D; por Kul 6549, Ap 1, Paechi, Lahaina, Maui; \$1, etc. B 311, p 233. Dated Mar. 5, 1908.

Antone Freitas and wf to Carrie Rickard; D; por Kul 6549, Ap 1, Paechi, Lahaina, Maui; \$1, etc. B 311, p 234. Dated Mar. 3, 1908.

Antone Freitas and wf to Antone J Freitas; D; por Kul 32, Ap 2, Lahaina-luna Rd, Lahaina, Maui; \$1, etc. B 311, p 235. Dated Mar. 3, 1908.

Antone Freitas and wf to Helen Freitas et al; D; pors Kul 6549, Ap 1, and Kul 32, Ap 2 Paechi, Lahaina, Maui; \$1, etc. B 311, p 237. Dated Mar. 3, 1908.

Haleakala Ranch Co to J B Castle; Agrmt; in re occupation and ownership of fenced 23-acre lot, Kaliahuni, Maui. B 321, p 20. Dated Dec. 16, 1908.

J B Castle to Haleakala Ranch Co; Agrmt; in re occupation and ownership of fenced 23-acre lot, Kaliahuni, Maui. B 321, p 20. Dated Dec. 16, 1908.

Kauwela and wf to Abel Cathcart; D; 1-4 int in pc land, Waiakua, Molokai; \$10. B 311, p 245. Dated Dec. 21, 1908.

## WOMEN'S MINDS.

"Women's minds are much cleaner than men's," remarked Mrs. Oliver Herford.

"They ought to be," replied her husband; "they change them so much oftener."

## Don't Get Excited!

We are not going to deliver any more political addresses for two years to come but will say that the

## Manhattan Cafe

is the only place in town where you can be served with a good, well-cooked meal at all hours of the day.

## MARUONO

A number of years with Dr. R. H. Dinegar  
Automobiles Repaired

Skilled Work.  
Reasonable charges.